Partial Listing

United States Patent [19]

Ogasawara

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[54] **ELECTRONIC SHOPPING SYSTEM INCLUDING CUSTOMER RELOCATION RECOGNITION**

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[51] Int. Cl.⁷ **G06K 5/00**

[52] U.S. Cl. **235/380; 235/381; 235/462.45; 235/472.01; 705/14**

[58] Field of Search 235/380, 381, 235/383, 451, 462.01, 462.45, 462.46, 472.01, 472.02; 705/10, 14, 16, 1

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[57] **ABSTRACT**

An electronic personal shopping system, communicating between a store computer and a mobile terminal, for organizing a consumer's movement through a retail facility in accordance with the consumer's current location and the locations of desired items on either a shopping list or a recommended replenishment item list. The shopping list and recommended replenishment item list are hosted on a customer IC card and read by a mobile shopping terminal. A price look-up table is maintained in a store database and includes location indicia identified to each merchandise item of the store's inventory. As a product is scanned, that item's location indicia is assumed to represent a customer's current location. A desired destination item is taken from the shopping list or the recommended replenishment item list and a distance and direction metric is calculated based on the customer's current location. The system includes a processor capable of developing a recommended replenishment item list from a series of shopping history data records also hosted on the IC card. Each shopping trip results in preparation of a most recent shopping history data record.

51 Claims, 8 Drawing Sheets
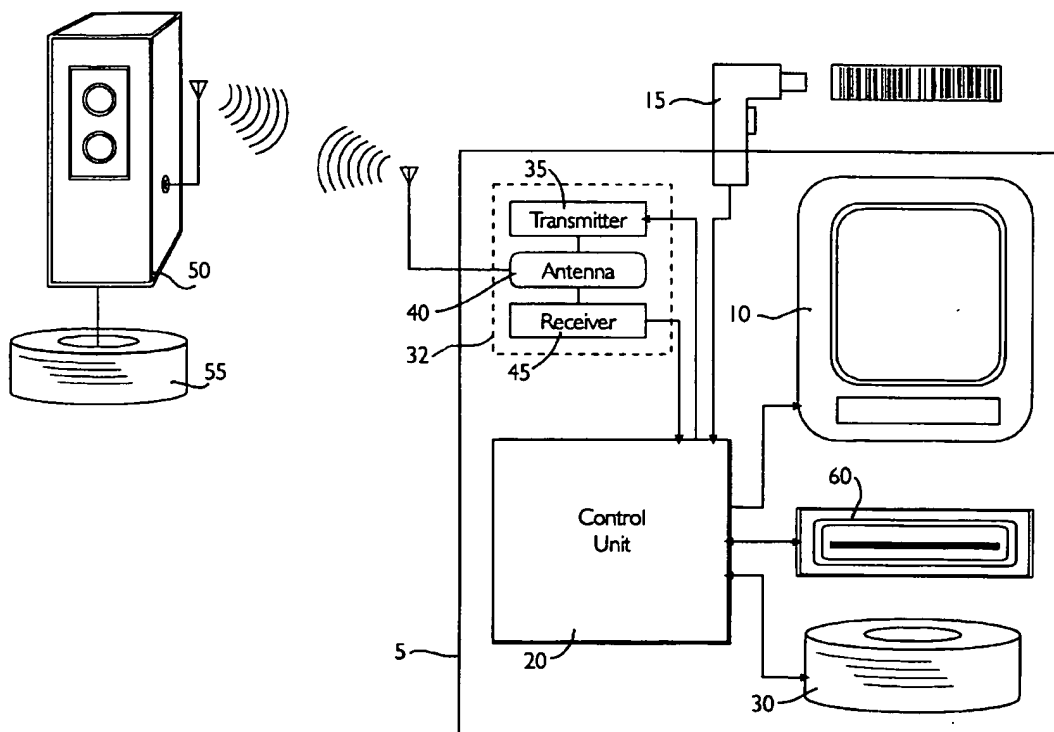
DOCUMENT-IDENTIFIER: US 6123259 A
TITLE: Electronic shopping system including customer relocation recognition

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BSPR:
In accordance with one aspect of the invention, the electronic personal
shopping system includes a mobile terminal which may be either hand-held or
mounted on a shopping cart at the desire of the customer. The mobile terminal
is a microprocessor controlled unit and includes a **portable scanner** configured
to read bar code information directly from items being considered for purchase.
The mobile terminal is further configured to communicate with a store central
computer by means of an individually addressable RF communication
transceiver.
Processed information is displayed to the customer on an LCD display panel.
The mobile terminal further includes a reader/writer unit for interfacing with
a smart-card like a customer ID card and a memory for storing data received
either from the store central computer, the customer ID card, or both.

DEPR:
Obtaining information relating to various purchased items is performed by a
universal product code (**UPC**) bar code scanner 15, connected to input **UPC** bar
codes to the mobile terminal 5. The display 10 and **UPC** bar code scanner 15
are, in turn, coupled to a microprocessor based control unit 20, operating
under firmware or software program control, for performing any needed data
processing functions and for controlling operation of the display 10.

DEPR:
As illustrated in FIG. 6, a PLU Table suitably comprises a merchandise specific
information set 300 and a merchandise location information set 310. The
merchandise specific information set 300 may be arranged in a variety of ways,
but is most advantageously configured as sequential entries, with each entry
specific to a particular piece of merchandise. A merchandise entry includes
the store's item identifier, such as a Stock Keeping Unit (SKU) number 302,
which is identified to a particular product's, Universal Product Code (**UPC**) by
a suitable conversion routine. An item entry further includes a text string,
identified to each product, which gives the brand or trade name of the product
and might include a generic description of the product as well as an
identifying weights and measures metric, i.e., KLEENEX.RTM. Tissues, 500
pcs.
In addition to the SKU number 302 and identifying text string 304, each item

entry includes a price field 306 which might be further subdivided into a field which contains the item price, i.e. $1.99, and a field which contains comparison price-per-unit prices, i.e., 0.2.cent. per piece. Thus, in accordance with the present invention, the merchandise specific information set 300 of the PLU. Table, contains all of the necessary information upon which to base a purchasing decision with respect to a particular piece of merchandise, organized in accordance with their SKU codes.

DEPR:
In one embodiment of the invention, when a customer desires to purchase an item, or to initialize the customer location recognition feature of the mobile terminal, the customer scans an item's **UPC** bar code, provided either on the product itself or in a convenient location on the display shelf proximate the item, using the **UPC** bar code scanner 15 provided on the mobile terminal. The item's **UPC** code is processed by the mobile terminal's control unit which may extract a particular item's SKU code from the **UPC** code and transmits the item's SKU number to the retail facility's core server (50 of FIG. 1) by means of its internal RF transceiver circuitry. Alternatively, rather than extracting an SKU code from the **UPC** bar code of a product, the mobile terminal's control unit may be configured to directly transmit all of the information comprising the **UPC** bar code to the retail facility's core server. Following transmission of the product information, the core server 50 invokes a search and retriever subroutine which enters the store database and searches the PLU Table comprising the database for the scanned item's SKU code.

DEPR:
An illustrated embodiment of the format of a customer shopping history is depicted, in conceptual form, in FIG. 3. The exemplary shopping history 74 is best understood as comprising a sequence of lists, with each list being headed by a date of purchase entry 76 and a total purchase amount entry 75. For each date of purchase, the list suitably comprises an item description 77 which would advantageously include an item's SKU or **UPC** code, an item's trade or brand name, generic name and an item's weights and measures metric, in a manner
similar to the PLU Tables of FIGS. 6 and 7.

DEPR:
A more detailed illustration of the conceptual layout of the replenishment item table (80 of FIG. 2) is illustrated in FIG. 4. In the illustrated embodiment, the replenishment item table 80 suitably comprises a multiplicity of horizontally disposed entries, each entry relating to a particular purchased item, and each entry subdivided into vertically disposed metrics, such that the entries and metrics define a table. Specifically, the metrics associated with each entry include an item description 100 comprising a particular item's SKU,

PLU or **UPC** code, the item's trade or brand name, generic description and weights and measures metric. The item replenishment table 80 further includes a last purchase date entry 105 for each item and a last purchase quantity entry 110. From the last purchase date 105 and last purchase quantity 110 entries for each item, either the store's core server, the consumer's home personal computer system or preferably the mobile terminal, is used to calculate an average purchase interval entry 115 and an average purchase quantity entry 120 for each of the items comprising the replenishment table. The number of past purchases, defining the number of times the item was purchased is entered for each item in a number of past purchases entry 125.

CLPV:
providing a mobile terminal, the mobile terminal including a microprocessor based control unit, an individually addressable RF communication transceiver, a **portable scanner** configured to read item code data, a reader/writer unit for interfacing with a personal memory store, a memory storage unit and a display;

CLPW:
a **portable scanner** configured to read item code data, the transceiver transmitting said code data to the store computer on command of the control unit as a customer inputs the code data for items being purchased;

CCXR:
705/14